

3. The internal high-pressure deformation method according to claim 1 further comprising allowing a relative motion toward each other of the first work piece part and of the second work piece part during the pressure agent sealingly pressing in the region of the first flange and of the second flange.

4. The internal high-pressure deformation method according to claim 1 further comprising performing a stamping in the region of the first flange and of the second flange during the pressure agent sealingly pressing together of the workpiece parts for influencing a flow of the material and/or for supporting a sealing and/or for accomplishing a positional fixation between the individual workpiece parts.

5. The internal high-pressure deformation method according to claim 1 further comprising moving a first engraving part pressing against the first flange against a second engraving part pressing against the second flange such as to generate a sealing between the first flange and the second flange.

of the second workpiece part sealingly together;
means for moving the tool regions and the segments away from
a hollow body formed of the first workpiece part and of the
second workpiece part for a removal of the hollow body from
the mold.

8. The apparatus according to claim 7 further comprising
stamping means disposed in the region of the first flange
and of the second flange.

9. The apparatus according to claim 7 wherein the tool
regions for insertion of the workpiece coincide with the
tool planes for removal of the hollow body.

10. The apparatus according to claim 7 wherein the tool
regions for insertion of the workpiece do not coincide with
the tool planes for removal of the hollow body.

11. An internal high-pressure deformation method for the
production of in particular bulging out and undercut hollow
bodies by employing at least two workpiece parts (1,2),
which two workpiece parts (1,2) are pressed pressure agent
sealingly in the region of a flange (1. 1,1.2) and which

RUM213SP

- 23 -

22

23 sealing and/or to accomplish a positional fixation between the individual workpiece parts (1,2).

15. An apparatus for production of in particular bulged out and undercut hollow bodies, wherein the apparatus is subdivided in tool regions (E1, E2, E3, E4) corresponding to the workpiece form to be generated and the number of workpiece parts (1, 2), wherein the tool regions (E1, E2, E3, E4) are disposed in different planes, wherein one or several tool regions (E1, E2, E3, E4) are subdivided in different segments (S, S1, S2, S3, S4) according to the shape of the workpiece, wherein the segments (S, S1, S2, S3, S4) are movable away from the hollow body (W) for removal of the hollow body (W) from the mold.

16. The apparatus according to claim 15 further comprising stamping elements disposed in the region of the flanges (1.1, 2.1).

17. The apparatus according to claim 15 wherein the tool regions (E1, E2, E3, E4) for insertion of the workpiece coincide or do not coincide with the tool planes for removal of the work piece.

ADD C4)

RUM213SP

- 25 -

23

engraving parts forming a mold;
pressing the first sealing face against the second sealing face such that the connection between the first flange and the second flange is sealing for a fluid pressure agent;
feeding pressure agent into a volume delimited by the first workpiece and by the second workpiece;
deforming the first workpiece and the second workpiece jointly by internal high-pressure deformation against the engraving parts and effected by the pressure agent;
moving the parts of the engraving away from each other to allow removal of the deformed first workpiece and of the deformed second workpiece from the mold for production of a bulging out and undercut hollow body.

2. The internal high-pressure deformation method according to claim 1 further comprising
inserting a third workpiece part adjoining the first flange region into the deformation tool; and
pressing the first flange against the third flange in pressure agent sealing way;
deforming the third work piece part together with the first work piece part and the second work piece part.

Sub 27
D2

6. The internal high-pressure deformation method according to claim 1 further comprising feeding pressure agent through a docking connection between a pressure feed and an opening in the second workpiece part.

Sub 27

7. An apparatus for production of bulged out and undercut hollow bodies comprising

- a first tool region;
- a second tool region;
- a third tool region, wherein the first tool region, the second tool region and the third tool region correspond to the workpiece form to be generated and to a first workpiece part and to a second workpiece part, wherein the tool regions are disposed in different planes, and wherein at least one of the tool regions is subdivided into two segments according to the shape of a corresponding one of the workpiece parts;
- first means for flange pressing disposed at the first tool region;
- second means for flange pressing disposed at the second tool region, wherein the first means for flange pressing and the second means for flange pressing are adapted to press a first flange of the first workpiece part and a second flange

two workpiece parts (1,2) are deformed jointly by the internal high-pressure deformation, wherein the deforming is performed against an engraving, wherein the parts of the engraving are movable away from each other in a direction of intersecting axes.

12. The internal high-pressure deformation method according to claim 11 wherein more than two workpiece parts (1,2) adjoining each other in the flange region are inserted into the deformation tool and are pressed against each other pressure agent sealingly in the flange region and are deformed.

13. The internal high-pressure deformation method according to claim 11 wherein the work piece parts (1,2) allow a relative motion toward each other during the pressure agent sealingly pressing in the flange region (1.1, 2.1).

14. The internal high-pressure deformation method according to claim 11 wherein a stamping is performed in the region of the flanges (1.1, 2.1) during the pressure agent sealingly pressing together of the work tool pieces (1,2) in order to influence the flow of the material and/or to support the

Cont.
501,453

An internal high-pressure deformation method for the production of in particular bulging out closed hollow bodies and a corresponding device are disclosed. At least two workpiece parts (1,2) are employed, wherein at least one of the two workpiece parts (1,2) preformed of cup shape and exhibits a flange, and are pressure agent sealingly pressed in the region of the flanges (1. 1,1.2) in the deformation tool according to the invention such that the two work tool pieces (1,2) are together deformed by the internal high-pressure deformation method and are further processed separately or jointly after the internal high-pressure deformation. The apparatus is subdivided in tool regions (E1, E2, E3, E4) corresponding to the work piece forms to be generated and corresponding to the number of the workpiece parts (1,2), wherein the tool regions (E1, E2, E3, E4) are disposed in different planes (figure 2).

DJ

rep/whr

DJ

RUM213SP